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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/643,946	08/23/2000	Kevin J. Torek	M4065.0166/P166-A	2940
24998	7590	10/28/2003	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			VINH, LAN	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	

1765

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/643,946

Applicant(s)

TOREK ET AL.

Examiner

LAN VINH

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 142, 144, 146-148, 150-152, 154-156 and 158 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 158 is/are allowed.
- 6) ☒ Claim(s) 142, 144, 146-148, 150-152 and 154-156 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 9/24/2003 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/643,946 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Objections

2. In line 8 of claim 142, the term "asorbic acid" appears to be a typographical error. The examiner suggests replacing "asorbic acid" with --ascorbic acid--

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 142, 144, 146-148, 150-152, 157-156 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bowden et al (US 5,320,709) in view of Torii et al (US 5,972,862) and further in view of Small (US 5,981,454)

Bowden discloses a method for selective removal of residues in a solution. This solution comprises of:

ammonium fluoride, which reads on a fluorine source (col 2, lines 35-36)

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propylene glycol (col 2, lines 62-64), which reads on a non-aqueous solvent of propylene carbonate

surfactants/additives (col 2, lines 65-66)

the solution is preferably as free of water as possible (col 2, lines 37-38), which reads on a conditioning solution is substantially free of water. Bowden also discloses that the ammonium fluoride and propylene glycol are present in the solution in a concentration for removal of residue¹⁸ on exposed metal surface 14 (col 3, lines 65-68, col 4, lines 60-65)

Unlike the instant claimed inventions as per claims 142, 150, Bowden does not disclose that his solution comprises phosphoric acid/a complementary acid and ascorbic acid/a surface passivating agent

However, Torii discloses a cleaning liquid for semiconductor device comprises fluorine-containing compound, solvent and phosphoric acid (col 5, lines 22-25)

Since both Bowden and Torii are concerned with the cleaning solution containing solvent, one skilled in the art would have found it obvious to modify Bowden's solution by adding phosphoric to the solution as per Torii because Bowden discloses that surfactants/additives can be used in his solution and Torii discloses that phosphoric acid is preferably used in combination with solvent in the cleaning liquid to increase the removal rate of the deposit polymer/residue (col 5, lines 8-50)

Bowden and Torii do not disclose using ascorbic acid in the solution

Small discloses a composition for cleaning semiconductor contains organic acid such as ascorbic acid (col 6, lines 44-45)

One skilled in the art would have found it obvious to modify Bowden and Torii cleaning solution by adding ascorbic acid in the solution as per Small because according to Small, organic acid such as ascorbic is very important to the cleaning treatment chemistries (col 6, lines 47-50)

Regarding claims 144, 152, since the cleaning solution of Bowden, Torii and Small contains the same passivation agent (ascorbic acid) as the claimed cleaning solution, it would have been obvious that Bowden, Torri and Small's ascorbic acid/passivating agent would have performed the same function (contributes to the selective removal by the cleaning solution by passivating any exposed metal on the semiconductor substrate) as the claimed cleaning solution.

Regarding claims 146-147, 154, 155, it is noted in page 14 of the specification, the applicants defines that the low pH of the conditioning solution tends to allow fluorine source present in the solution to exist as molecular form. Since Bowden discloses that his solution having a neutral pH, it is obvious that the ammonium fluoride/fluorine source in Bowden solution remaining in molecular form and contributes to the selective removal of the cleaning solution.

Regarding claims 148, 156, it is noted in page 11 of the specification, the applicants defines that the sufficient concentration of the claimed elements in the cleaning solution as (0.01%-5.0% HF/fluorine source, 80-99% alcohol, 0.003-1.0% complimentary acid, 0.001-1.0% of citric acid) to suppress the solubility of aluminum fluoride. Since Bowden's solution having the concentration of (0.5-10% of ammonium fluoride/fluorine source, 90-99.5 % alcohol), which reads on the claimed concentration, it would be

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obvious that the concentration of Bowden solution would have suppressed the solubility of aluminum fluoride.

The limitation of claim 151 has been discussed above.

Allowable Subject Matter

5. Claim 158 is allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 158, no prior art of record discloses a conditioning solution contains about 0.27 weight percent of molecular HF and H₂F₂.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jagannathan et al. (US 5,304,284) discloses that alcohols are non-aqueous solvents (col 5, lines 46-48)

Response to Arguments

7. Applicant's arguments with respect to claims 142, 144, 146-148, 150-152, 154-156 (filed on 8/26/2003) have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAN VINH whose telephone number is 703 305-6302. The examiner can normally be reached on Monday-Friday 8:30 -6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703 305-2667. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.



LV
October 16, 2003